

WHAT IS CLAIMED IS:

1. A handoff method of performing a handoff when mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a mobile IP network, said method comprising the steps of:

when starting a handoff, additionally performing a regional registration of said mobile terminal equipment so as to doubly register said mobile terminal equipment so that said mobile terminal equipment is associated with both said previous foreign agent and said new foreign agent;

determining whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic when said mobile terminal equipment is doubly registered;

bicasting the IP packet to both said previous foreign agent and said new foreign agent if the IP packet is of real-time traffic, and buffering the IP packet if the IP packet is of non-real-time traffic;

when the handoff is completed, updating the regional registration associated with said previous foreign agent so that said mobile terminal equipment is associated only with said new foreign agent; and

when IP packets of non-real-time traffic are buffered, transferring the buffered IP packets of non-real-time traffic to said new foreign agent.

2. The handoff method according to Claim 1, wherein in said double regional registration step, said mobile terminal equipment is registered with a home agent, and said home agent performs said IP packet determination step,

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said bicasting and buffering step, and said transferring step.

3. The handoff method according to Claim 2, wherein
5 said home agent determines whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic based on information on a header of the IP packet.

4. The handoff method according to Claim 2, wherein
10 said home agent determines whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic based on information on an upper layer, which is placed in a payload of the IP packet.

5. The handoff method according to Claim 1, wherein
15 in said double regional registration step, said mobile terminal equipment is registered with a gateway foreign agent, and said gateway foreign agent performs said IP packet determination step, said bicasting and buffering
20 step, and said transferring step.

6. The handoff method according to Claim 5, wherein
said gateway foreign agent determines whether or not an IP packet destined for said mobile terminal equipment is of
25 real-time traffic based on information on a header of the IP packet.

7. The handoff method according to Claim 5, wherein
said gateway foreign agent determines whether or not an IP
30 packet destined for said mobile terminal equipment is of

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real-time traffic based on information on an upper layer, which is placed in a payload of the IP packet.

8. The handoff method according to Claim 1, wherein
5 said mobile IP network is a cellular phone network in accordance with Radio Access Network standards which can perform a mobile IP procedure, said mobile terminal equipment is a cellular phone, and each of said new and the previous foreign agents is a radio network control unit
10 that can give and receive an authority to control said cellular phone, as a handoff, according to an SRNC relocation procedure.

9. The handoff method according to Claim 8, wherein
15 said radio network control unit piggybacks a mobile IP message onto a control message according to the SRNC relocation procedure.

10. The handoff method according to Claim 8, wherein
20 said radio network control unit detects a start time and end time of the handoff according to an SRNC relocation procedure, and, when said cellular phone can establish communication according to mobile IP, notifies said cellular phone of the start time and end time of the
25 handoff according to the mobile IP procedure.

11. The handoff method according to Claim 8, wherein
said radio network control unit detects a start time and end time of the handoff according to an SRNC relocation
30 procedure, and, when said cellular phone cannot establish

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communication according to mobile IP, notifies said cellular phone of the start time and end time of the handoff according to the SRNC relocation procedure, and autonomously performs a regional registration of said
5 cellular phone or changes the regional registration.

12. The handoff method according to Claim 8, wherein after a plurality of radio network control units have accommodated said cellular phone, a previous one of the
10 plurality of radio network control units assumes that an SRNC relocation procedure generated after a predetermined transfer of an authority to control the cellular phone is a handoff procedure, so as to detect the start time and end time of the handoff.

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13. A handoff method of performing a handoff when mobile terminal equipment is moving from a previous foreign agent to a new foreign agent in a mobile IP network, said method comprising the steps of:

20 when starting a handoff, additionally performing a regional registration of said mobile terminal equipment with a home agent so as to doubly register said mobile terminal equipment so that said mobile terminal equipment is associated with both said previous foreign agent and
25 said new foreign agent;

allowing said home agent to determine whether or not an IP packet destined for said mobile terminal equipment is of real-time traffic when said mobile terminal equipment is doubly registered;

30 allowing said home agent to bicast the IP packet to

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both said previous foreign agent and said new foreign agent if the IP packet is of real-time traffic, and transferring the IP packet to said previous foreign agent if the IP packet is of non-real-time traffic;

5 allowing said previous foreign agent to buffer the IP packet of non-real-time traffic transferred from said home agent therein;

 when the handoff is completed, if IP packets of non-real-time traffic are buffered in said previous foreign
10 agent, allowing said previous foreign agent to transfer the buffered IP packets of non-real-time traffic to said new foreign agent; and

 when the handoff is completed, updating the regional registration associated with said previous foreign agent so
15 that said mobile terminal equipment is associated only with said new foreign agent.

14. An agent apparatus for transferring IP packets to a new foreign agent in a mobile IP network, to which mobile
20 terminal equipment is moving, said apparatus comprising:

 a means for, upon receiving an IP packet destined for said mobile terminal equipment when said mobile terminal equipment is doubly registered during a handoff, determining whether or not the IP packet is of real-time
25 traffic;

 a means for bicasting the IP packet to both said previous foreign agent and said new foreign agent if the IP packet is of real-time traffic, and for buffering the IP packet if the IP packet is of non-real-time traffic;

30 a means for, when the handoff has been completed and

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IP packets of non-real-time traffic are buffered,
transferring the buffered IP packets of non-real-time
traffic to said new foreign agent.

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